# REPORT OF THE COMMITTEE ON COLD WEATHER TROUBLES

The Committee received 85 replies in response to its questionnaire regarding the cold weather troubles of 1917–1918. The information has been tabulated and is filed with the Secretary. The data thus obtained were both interesting and valuable, but lack the uniformity necessary to make a comprehensive comparison, and the Committee did not feel that the data furnished were such as to warrant the expense of printing.

Extreme low temperatures prevailed throughout the country during the winter of 1917–1918. Unfortunately, the replies to the questionnaire seldom gave temperature where trouble was experienced and did not indicate the close relation between trouble and temperature that one might expect. Trouble was experienced in comparatively high temperatures in some localities and none reported at low temperatures in others, without any explanation of this unusual condition. In few cases was there any mention as to the depth of snow. Nearly all reported an increase in consumption during the cold period.

The data in regard to depth of covering were interesting but not conclusive except in emphasizing the need of giving special study to local conditions. Pipe having a covering of 54 inches of coarse gravel froze while pipe having only 28 inches, laid in wet ground, escaped. The size of the pipe and circulation being the same, it is reasonable to suppose that the nature of the covering material accounted for the difference.

In few cases was there any mention as to the kind of pavement in streets where freezing occurred, and no facts furnished on which to base opinions as to the effects of same.

The question of covering should receive the careful consideration of the local management.

The data in regard to thawing were more complete. Forty-six replies reported in more or less detail the use of electrical current in thawing; 22 reported as to other means, steam, etc. Important details, however, were lacking in many cases. In 53 of the cases

the information was not comparable. Steam was used successfully in a number of cases.

The majority of replies clearly favored the use of electrical thawing and indicated that this method afforded advantages as to both cost and efficiency. The cost data were incomplete, only a few replies giving details as to length or size of pipe, time, etc. The cost for service work ranged from $1.90 to $139 per service; and the time from thirty minutes to two days. In general, it may be said that the expense of thawing a service was under $9.00 and the time required less than one hour. In the majority of the cases reported the current was taken from the local lighting company; fourteen water companies did their own work of thawing; and in five cases the work was done by plumbers. The current used ranged from 5 volts and 150 amperes to 125 volts and 600 amperes. Storage batteries were used to some extent. There is a possibility that the use of electrical current may damage the pipe connections. The Committee recommends that those using this method carefully note the effect with a view of subsequent report to the Association.

Many automobiles were converted into effective thawing outfits, and there are undoubtedly possibilities in this line. The Committee endeavored to obtain from manufacturers specifications for an outfit, low in first cost, light in weight, simple and effective, that could be easily transported by sleigh or auto and operated by gas engine or the auto engine itself. The Committee believes there is a market for such an outfit and hopes that the manufacturers will give the matter earnest consideration. The Committee would recommend a generator operated by a gas or oil engine, mounted on an iron frame, equipped with rheostat, automatic circuit breaker, voltmeter, ammeter, cable, etc., all to be mounted on a trailer or sleigh, and further suggests the use of a current of from 30 to 50 volts and 130 to 400 amperes. There should be a rheostat control to permit increase or decrease in the voltage without interfering with the proper operation of the outfit. By proper manipulation, such an outfit should serve both for service work and reasonably sized pipes and, if properly and carefully handled, would be safe and effective. It was suggested that where high voltage current was available, an alternating current transformer be held in reserve so that if more convenient, current could be taken from the power company. The manipulation in this case should be entirely under the control of the power company. It must be borne in mind that

in the use of any electrical current for thawing there is definite risk and that care and common sense must be exercised.

The greatest cold weather trouble probably comes from frozen services, at least the greatest "kick" comes from this source. The service pipes are seldom laid as deep as the mains and more often with much less covering, exactly the reverse of what it should be. Not infrequently the tap is made near the top of the main and the gooseneck is perhaps 4 to 8 inches above the main. Services should have more covering than the mains and should be carefully inspected, especially if laid by plumbers. A main or service that has once given trouble should be lowered to prevent a repetition of it.

A frozen service is more or less inconvenient but a hydrant out of commission creates a serious risk. Hydrants should receive special attention and every hydrant on the system should be inspected late in the fall. The drip should be open, if the hydrants are set so they can drain. If set in water, the drip should be plugged and the hydrants pumped out. Those on dead ends should be packed. Where it is necessary to take these precautions, hydrants should be inspected frequently. There should be a rigid rule to prevent unskilled or curious people opening hydrants during cold weather "to see if water will run," a not infrequent cause of trouble.

Frozen hydrants were reported successfully cleared by steam, hot brine, calcium carbide, alcohol or by building a fire about them. No information was given as to the effect of salt or carbide on the valves. Alcohol was reported as giving satisfactory results but it is rather expensive and since the Volstead Amendment might be considered unsafe, not, however, as unsafe as the practice of building fires. Ordinary hot brine will do good work. If the trouble is in the branch, salt and carbide are said to be effective.

To the question, "If chemicals were used, give commercial names, etc." the questionnaire brought no response but on the contrary several inquiries as to what the Committee had in mind. It had hopes that some genius might have discovered an inexpensive mixture that would prevent freezing and not injure the valves and working parts of the hydrant.

The operating man must study the conditions in his locality and solve them as a local problem and not be governed too much by what may be good practice in other localities. This refers not especially to cold weather troubles, (which after all are of comparatively small moment) but to the operation of the entire plant. The actual

number of services, hydrants and mains frozen is a very small percentage of the whole, and indicates that water works in general are as efficiently managed as other businesses. The Committee has data furnished by the replies as to the number of frozen meters, services and hydrants but doubts if the average is indicated; and any conclusions therefrom might be misleading.

The Committee feels that it has, so far as was within its power, accomplished the work for which it was appointed, and respectfully asks to be discharged.

Respectfully submitted,

CHARLES R. BETTES,
*Chairman.*